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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/820,025

04/08/2004

Masaaki Oyamada

0092/011001

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05/15/2009

SMITH PATENT OFFICE

1901 PENNSYLVANIA AVENUE N W

SUITE 901

WASHINGTON, DC 20006

EXAMINER

LIGHTFOOT, ELENA TSOY

ART UNIT

PAPER NUMBER

1792

MAIL DATE

DELIVERY MODE

05/15/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/820,025	Applicant(s) OYAMADA ET AL.	
	Examiner Elena Tsoy Lightfoot	Art Unit 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 February 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3-5, 7, 9, 10, 12, 14, 15 and 20-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 3-5, 7, 9, 10, 12, 14, 15 and 20-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Response to Amendment

Amendment filed on February 20, 2009 has been entered. Claims 3-5, 7, 9, 10, 12, 14, 15 and 20-22 are pending in the application.

Examiner Note

1. A phrase “initial *thin* nickel film” was interpreted by the Examiner according to the specification as originally filed as a film having thickness within a range of 0.001-2 microns (See published Application, P31).

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 3-5, 7, 9, 10, 12, 14, 15 and 20-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 3, 20 and 21 have been amended to recite the steps of “(II) adding a slurry, which includes the core particles prepared by said step of (I) allowing core particles, into an aqueous medium...”, which is confusing because the meaning of the phrase is not clear. For examining purposes the phrase was interpreted as “(II) adding a slurry, which includes the core particles prepared by said step of (I) ~~allowing core particles, into an aqueous medium...~~”.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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5. Claims 3-5, 7, 9, 10, 12, 14, 15 and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawakami et al (JP 1-242782).

Kawakami et al is applied here for the same reasons as set forth in paragraph 3 of the Office Action mailed on 8/25/2008.

As to amendment, Kawakami et al teaches that an aqueous suspension (**slurry**) of catalyst plated core particles is prepared *before* carrying out electroless plating treatment (See page 16) either in water alone (See page 17, paragraph 2, lines 1-2) or in an aqueous solution of a complexing agent (See page 17, paragraph 2, lines 3-6). A (nickel) plating solution which is prepared in advance (See page 18, last line) is gradually added to the aqueous suspension (**slurry**) of catalyst plated core particles (See page 19, lines 1-2) or adding *at least two* solutions constituting electroless plating solution individually and simultaneously to an aqueous suspension of core particles formed with one of components constituting an electroless plating solution in particular with a solution of a complexing agent (See Translation, page 17, paragraph 2, lines 6) to allow plating reaction to take place (See Translation, page 19, paragraph 1).

Kawakami et al fails to teach that slurry of catalyst plated core particles is added to a nickel plating solution.

However, it is well settled that selection of any order of mixing ingredients is *prima facie* obvious. In re Gibson, 39 F.2d 975, 5 USPQ 230 (CCPA 1930).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have added slurry of catalyst plated core particles to a nickel plating solution in Kawakami et al instead of adding a nickel plating solution to the slurry of catalyst plated core particles in the absence of showing of criticality.

As to claimed step III, Kawakami et al teaches that the nickel plated layer can be produced by adding *at least two* solutions constituting electroless (nickel) plating solution individually and simultaneously to the aqueous suspension of core particles to allow plating reaction to take place (See Translation, page 19, paragraph 1). Kawakami et al fails to teach that one more plated nickel layer is applied over the plated nickel layer (Claims 3 and 20).

However, it is a well-known principle to reapply a coating composition to achieve a desired thickness of a final coating depending on intended use of the final coated product.

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Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have reapplied a plated nickel layer in Kawakami et al, according to well-known principle, with the expectation of providing the desired thickness of a final coating.

It is the Examiner's position that the plated nickel film includes columnar structures extending in a direction of thickness of a nickel film since it is formed by a process substantially identical to that of claimed invention.

Applicants traverse the Examiner's statement that if the initial plated nickel layer was too thin, i.e. was not of desired thickness, the plating process can be repeated in the presence of wastewater of the initial nickel plating solution (see page 4 of the office action) because:

1) Kawakami et al. teach away from the presently claimed invention because of the following reasons. The present invention discloses the initial thin film formation step (the claimed step (II)) for forming an initial thin nickel film, and the electroless plating step (the claimed step (III)) for performing electroless plating so that grainless boundaries are recognized in cross section in a direction of a thickness of the nickel film. On the other hand, in the section "The problems to be solved by the invention" in Kawakami et al., discloses that the thickness of the plating metal film is required to be as small as possible from the practical and economical point of view, and for that purpose, a uniform and strong film must be formed (see page 6, lines 12-15 of the translation). Also, in the section "the Advantages" in Kawakami et al., discloses that consequently, according to the invention, since the metallization ratio can be set as low as possible, i.e., a strong plating film of a submicron order can be imparted, it is possible to obtain a plated powder with a low specific gravity (see page 39, line 23 - page 41, line 2 of the translation). Accordingly, applicants respectfully submit that Kawakami et al. teach away from the presently claimed invention because Kawakami et al. requires the thickness of the plating metal film as small as possible from the practical and economical point of view. Also, applicants respectfully submit that it would not have been obvious to add a second nickel film layer over the applied nickel film layer in Kawakami et al. because Kawakami et al. already achieved a uniform and strong film with the small thickness of the plating metal film.

The Examiner respectfully disagrees with this argument. First of all, in the section "The problems to be solved by the invention", Kawakami et al. discloses that **although** the thickness of the plating metal film is required to be as small as possible from the practical and economical point of view, and for that purpose, a *uniform* and strong film must be formed (see page 6, lines 12-15 of the translation). In other words, Kawakami et al does not limit its teaching to as small as possible thickness, rather Kawakami et al teaches that *uniformity of the layer is more important*.

Second, the phrase "as small as possible" is not limited to any specific thickness. It reads on "a strong plating film of a **submicron** size", i.e. on thickness up to 0.999 microns.

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Third, “a strong plating film of a **submicron**” in Kawakami et al which may read on up to 0.999 micron thickness, can be clearly built up by reapplying a plated layer of 0.001 microns at each plating step. Thus, in contrast to Applicants statement, Kawakami et al. does not teach away from the presently claimed invention.

2) The Examiner believed that it would have been obvious to use the well-known principle of reapplying a coating composition to achieve a desired thickness of a final coating depending on the intended use of the final coated product. Applicants respectfully request that the Examiner provide documentary evidence or a reference to support the Examiner's conclusion of this point.

Applicants may look at US 5262718 to Svendsen et al for teaching that the **desired thickness** of a plated metal layer can be reached by **re-applying** electroless plating to a substrate surface (See column 5, lines 55-57).

3) Applicants respectfully submit that in the method of Kawakami et al., control of the thickness of the plating film is based on adjusting the amount of the metal salt (addition) before adding it to the aqueous suspension. Kawakami et al. do not need to reapply the additional plating solution after completing the plating films on the core particles. In other words, the method of Kawakami et al. adds the plating solution in the aqueous suspension only one time and controls the thickness of the plating film. Therefore, Kawakami et al. never teach, suggest or disclose the second nickel film layer over the applied nickel film layer of Kawakami et al. and applicants respectfully submit that it would not have been obvious to use the well-known principle of reapplying a plated nickel layer in Kawakami et al. with the expectation of providing the desired thickness of a final coating for the reasons detailed above. Moreover, in the present invention, the two plating solutions are added in the aqueous suspension containing the core particles provided with the initial thin nickel films (the claimed step III) because the present invention intends to make grainless boundaries recognized in cross section in a direction of a thickness of the nickel film (not controlling the desired thickness of the final coating as discussed by the Examiner). Therefore, the crystal grainless boundaries include a high dhesion between the nickel film and the surface of the core particle. Also, the film becomes dense and homogeneous, resulting in an increase in adhesion between the nickel film and the surface of the core particle.

The Examiner respectfully disagrees with this argument. First of all, Kawakami et al teaches *nowhere* that a single plating operation can achieve **any** desired thickness. Kawakami et al teaches that a plating solution having a *saturation* concentration of each agent can be used (See page 20, lines 1-2) to obtain thickness of **50 Angstrom** **or more** (See page 9, paragraph 2) without indicating **more** possible thicknesses. Furthermore, since saturation concentration is

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limited, the desired thickness might not be obtained in a single plating operation if the desired thickness is thicker than the thickness that can be obtained in a single plating operation.

6. Claims 3-5, 7, 9, 10, 12, 14, 15 and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawakami et al '782, as applied above, further in view of Kaneyoshi (US 20010055685).

Kawakami et al teaches that the nickel plated layer can be produced by adding *at least two* solutions constituting electroless plating solution individually and simultaneously to an aqueous suspension of core particles formed with one of components constituting an electroless plating solution in particular with a solution of a complexing agent (See Translation, page 17, paragraph 2, lines 6) to allow plating reaction to take place (See Translation, page 19, paragraph 1). Kawakami et al fails to teach adding slurry to a nickel plating solution.

Kaneyoshi teaches that it is not critical how to form the electroless plating layer. A choice may be made among a variety of techniques, for example, a technique of directly admitting a core powder into a plating solution obtained by mixing a metal ion, reducing agent, complexing agent, buffer agent and the like, and adjusting the pH and temperature; a technique of admitting a *slurry of a core powder in water* into the same plating solution as above; and a technique of dispersing a core powder in a plating solution from which some components have been excluded and then adding the excluded components. The plating solution composition may be selected from well-known bath compositions for electroless nickel plating and electroless copper plating. See P18. In other words, Kaneyoshi teaches that electroless nickel plating layer may be formed by adding slurry of core particles in water to a plating solution or adding excluded plating solution components to *slurry* of core particles formed with one of plating components.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have added slurry of core particles in water to a plating solution in Kawakami et al instead of adding at least two solutions constituting electroless plating solution individually and simultaneously to an aqueous suspension of core particles formed with one of components with the expectation of providing the desired electroless nickel plating layer since Kaneyoshi teaches that electroless nickel plating layer may be formed by adding slurry of core particles in water to a plating solution or adding excluded plating solution components to *slurry* of core particles formed with one of plating components.

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7. Claims 3-5, 7, 9, 10, 12, 14, 15 and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawakami et al '782 or Kawakami et al '782 in view of Kaneyoshi '685, as applied above, and further in view of Svendsen et al (US 5262718).

As to claimed step III, Kawakami et al teaches that the nickel plated layer can be produced by adding **at least two** solutions constituting electroless (nickel) plating solution individually and simultaneously to the aqueous suspension of core particles to allow plating reaction to take place (See Translation, page 19, paragraph 1). Kawakami et al fails to teach that one more plated nickel layer is applied over the plated nickel layer (Claims 3 and 20).

However, it is a well-known principle to reapply a coating composition to achieve a desired thickness of a final coating depending on intended use of the final coated product.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have reapplied a plated nickel layer in Kawakami et al, according to well-known principle, with the expectation of providing the desired thickness of a final coating.

Svendsen et al is applied here as evidence that it is well known in the art that the **desired thickness** of a plated metal layer can be reached by **re-applying electroless plating** to a substrate surface (See column 5, lines 55-57).

8. Claims 3-5, 7, 9, 10, 12, 14, 15 and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawakami et al '782 or Kawakami et al '782 in view of Kaneyoshi '685 or over Kawakami et al '782 in view of Svendsen et al or Kawakami et al '782 in view of Kaneyoshi '685, further in view of Svendsen et al, as applied above, and further in view of Weber et al (US 6,274,241) for the reasons of record set forth in paragraph 4 of the Office Action mailed on 8/25/2008.

9. Claims 3-5, 7, 9, 10, 12, 14, 15 and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over the cited prior art, as applied above, as applied above, and further in view of Segawa et al (JP 2001-316834) for the reasons of record set forth in paragraph 5 of the Office Action mailed on 8/25/2008.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elena Tsoy Lightfoot whose telephone number is 571-272-1429. The examiner can normally be reached on Monday-Friday, 9:00AM - 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Elena Tsoy Lightfoot, Ph.D.
Primary Examiner
Art Unit 1792
May 14, 2009

/Elena Tsoy Lightfoot/